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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,572	01/28/2002	Joseph J. Stevens	5840.03/CPI/COPPER/PJS	7921
32588	7590	03/24/2004	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			MOORE, KARLA A	
			ART UNIT	PAPER NUMBER

1763

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/059,572

Applicant(s)

STEVENS ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19,20,22-25,27,32-36,38-40 and 96-101 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19,20,22-25,27,32-36,38-40,96,97,100 and 101 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 0204.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 19-20, 22-25, 38-40 and 101 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,632,335 to Kunisawa et al.

3. Kunisawa et al. disclose a substrate processing apparatus, comprising: an evaporation shield (Figure 42, 210) adapted to be positioned over a substrate contacting a substrate support (230), the evaporation shield having a fluid retaining surface adapted to form a gap (244) with respect to the substrate wherein the thickness of the gap is between about 0.5mm and about 4mm.

4. With respect to claim 20, the shield is sized to substantially cover the substrate (see Figure 42).

5. With respect to claim 22, the gap is adapted to be filled with a fluid layer (244).

6. With respect to claims 23-25, the evaporation shield may further comprise at least one port to deliver fluid (Figure 28, 98a) to form a fluid to form the fluid layer and at least one port to reclaim a fluid (98b) on the substrate.

7. With respect to claim 38, the evaporation shield further comprises fluid agitation components, selected from the group consisting of channels, veins and protrusions (column 27, row 46 through column 28, row 13; Figures 31A and 31B, 110b), the fluid agitation components being disposed on a bottom surface of the evaporation shield.

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8. With respect to claims 39 and 40, the evaporation shield may be comprised of a polymer or comprise a material selected from the group consisting of polymers, ceramics, quartz and coated metals (column 19, rows 49-60).

9. With respect to claim 101, the evaporation shield is adapted to rotate (column 33, rows 23-25).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kunisawa et al. as applied to claims 19-20, 22-25, 38-40 and 101 in view of German Patent No. 29922090U1 to Sotralentz.

11. Kunisawa et al. disclose the invention substantially as claimed and as described above. Additionally, Kunisawa et al. provide motivation for providing degassing means in the invention (column 5, rows 15-31)

12. However, Kunisawa et al. fail to teach the evaporation shield specifically comprising a degassing membrane.

13. Sotralentz teaches the use of a degassing membrane provided in a container top (Figures 1-2 and abstract) for the purpose of provide a container capable of simple and effective degassing.

14. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an evaporation shield comprising a degassing membrane in Kunisawa et al. in order to provide a container capable of simple and effective degassing as taught by Sotralentz.

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15. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,632,335 to Kunisawa et al. in view of U.S. Patent No. 4,120,699 to Kennedy, Jr. et al.

16. Kunisawa et al. disclose a substrate processing apparatus substantially as claimed in Figure 42 and comprising: an evaporation shield (Figure 42, 210) adapted to be positioned over a substrate contacting a substrate support (230), the evaporation shield having a fluid retaining surface adapted to form a gap (244) with respect to the substrate wherein the thickness of the gap is between about 0.5mm and about 4mm.

14. However, Kunisawa et al. fail to teach a transducer coupled to/disposed against the evaporation shield to provide acoustic waves to the fluid layer.

15. Kennedy, Jr. et al. teach the use of a plurality of transducers (Figure 3, 26, 28 and 30) spaced about the walls of a chamber (including the top) for the purpose of causing acoustic waves with constructive interference that sweeps over a substrate to be processed and results in needing a shorter period of time for cleaning a substrate with an irregular surface (column 4, rows 4-32).

16. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a transducer coupled to an evaporation shield in Kunisawa et al. in order to cause acoustic waves with constructive interference that sweep over a substrate to be processed and result in the need for a shorter period of time to clean a substrate with an irregular surface as taught by Kennedy, Jr. et al.

17. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kunisawa et al. and Kennedy, Jr. et al. as applied to claims 32 and 33 above, and further in view of U.S. Patent No. 6,224,713 to Hembree et al.

18. Kunisawa et al. and Kennedy, Jr. et al. disclose the invention substantially as claimed and as described above.

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19. However, Kunisawa et al. and Kennedy, Jr. et al. fail to disclose the transducer comprising a rod which is adapted to contact a fluid layer.

20. Hembree et al. teach mounting a transducer (Figure 5, 28) on a submersible rod (34) to transmit energy from the transducer to a processing solution for the purpose of preventing the need to bring the transducer in direct contact with the solution (column 5, rows 49-53).

21. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a submersible rod for mounting a transducer in Kunisawa et al. and Kennedy, Jr. et al. in order to prevent the need for bringing the transducer in direct contact with a processing solution as taught by Hembree et al.

22. Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunisawa et al. as applied to claims 19-20, 22-25, 38-40 and 101 above, in view of U.S. Patent No. 5,853,961 to Sakai et al.

23. Kunisawa et al. disclose the invention substantially as claimed and as described above.

24. However, Kunisawa et al. fail to teach the evaporation shield comprises a seal adapted to contact the substrate support or that the substrate supports comprises a seal adapted to contact the evaporation shield.

25. Sakai et al. teach the use of a sealing O-ring (Figure 10; column 46, rows 45-47) for the purpose of sealing gaps between a shield/cover (40g) and a substrate support (40h) to prevent outward leakage of a treatment liquid.

26. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an evaporation shield comprising a seal adapted to contact the substrate support or a substrate support comprising a seal adapted to contact the evaporation shield in Kunisawa et al. in order to ~~prevent~~ seal a treatment gap and prevent the outflow of a treatment liquids as taught by Sakai et al.

27. Claims 96 and 97 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,632,335 to Kunisawa et al. in view of German Patent No. 29922090U1 to Sotralentz.

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28. Kunisawa et al. disclose a substrate processing apparatus substantially as claimed in Figure 42 and comprising: an evaporation shield (Figure 42, 210) adapted to be positioned over a substrate contacting a substrate support (230), the evaporation shield having a fluid retaining surface adapted to form a gap (244) with respect to the substrate wherein the thickness of the gap is between about 0.5mm and about 4mm.

29. However, Kunisawa et al. fail to teach the evaporation shield comprising a degassing membrane and a plenum in communication with the degassing membrane or a plenum port coupled to the plenum.

30. Sotralentz teaches the use of a degassing membrane provided in a container top (6, Figures 1-2 and abstract) for the purpose of provide a container capable of simple and effective degassing. The device further comprises a plenum (area between 6 and 7) and plenum port (8) coupled to the plenum.

31. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an evaporation shield comprising a degassing membrane, plenum and plenum port in Kunisawa et al. in order to provide a container capable of simple and effective degassing as taught by Sotralentz.

32. Claims 100 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kunisawa et al. as applied to claims 19-20, 22-25, 38-40 and 101 above, in view of U.S. Patent No. 4,821,675 to Ikeno et al.

33. Kunisawa et al. disclose the invention substantially as claimed and as described above.

34. However, Kunisawa et al. fail to teach the evaporation shield is adapted to provide heat to the fluid layer.

35. Ikeno et al. teach the use of an evaporation shield/cover/lid adapted to provide heat to a fluid layer in a substrate processing apparatus for the purpose of restraining temperature variation of the fluid (column 2, rows 40-43 and column 2, rows 65-column 3, row 2).

36. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an evaporation shield/cover/lid adapted to provide heat to a

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fluid layer in a substrate processing apparatus in Kunisawa et al. in order to restrain temperature variation of the fluid as taught by Ikeno et al.

Allowable Subject Matter

37. Claims 98 and 99 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art of record fails to teach or fairly suggest a vacuum/low partial pressure source coupled to the plenum port of the apparatus. Nor does any other piece of art provide motivation for combination of this feature with the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

38. Applicant's arguments with respect to use of the Ohkuma reference and the rejection(s) of claim(s) 19-20, 22-25 and 35-36 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kunisawa et al. Kunisawa et al. disclose an apparatus adapted to support a substrate contacting a substrate support. Kunisawa et al. also explicitly teach the claimed gap thickness, which makes Applicant's argument regarding the claimed gap thickness mute.

39. After consideration of the Arguments provided in the after final amendment and interview (2/27/04), Examiner came to the conclusion that the previously filed limitation of "the substrate being disposed on the support" *and* the presently submitted amendment to further clarify that the substrate actually contacts the support are not fairly taught by Ohkuma, thus the rejections were withdrawn and the above rejections are presented.

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40. Applicant's arguments with respect to use of the Sotralentz reference (claims 27 and 96-97) have been considered but are moot in view of the new ground(s) of rejection. Kunisawa et al. is now relied upon for providing motivation for providing degassing means. Sotralentz provides a simple and effective way of accomplishing degassing.

41. Applicant's arguments with respect to the combination of Ohkuma and Kennedy et al. (claims 32-34) have been considered but are moot in view of the new ground(s) of rejection. Kunisawa et al. who teach the use of agitation is used in place of Ohkuma in the rejection. Kennedy et al. provides an alternative means and motivation for providing the agitation.

42. Applicant's arguments filed with respect to claim 34 have been fully considered but they are not persuasive. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

43. Applicant's arguments with respect to use of the Chao et al. reference (claim 38) have been considered but are moot in view of the new ground(s) of rejection. Kunisawa et al. disclose fluid agitation means disposed on the bottom surface of an evaporation shield.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 571.272.1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karla Moore
19 March 2004


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